## CHAPTER 3 WATER STORAGE TANKS, WATER HEATERS, HYDRO-PNEUMATIC TANKS

### 300 HOT WATER STORAGE TANKS AND WATER HEATERS

300.1 Each hot water storage tank, range boiler, or automatic storage water heater, having a nominal water-containing capacity of 120 gallons or less shall be built for a minimum working pressure of one hundred twenty five (125) pounds per square inch and shall be tested hydrostatically to three hundred (300) pounds per square inch.

300.2 Each tank shall have clearly and indelibly stamped or stencilled thereon the name of the manufacturer, the maximum allowable working pressure for which it is built, and the test pressure.

300.3 Tanks of ferrous metal shall be galvanized inside and outside after construction, except that the galvanizing may be ommited when the tanks are built or lined in accordance with §300.11.

300.4 Each tank for the storage of hot water, either with or without a heating coil, except those specified in §§300.1 - 300.3, and each converter or heat exchanger, or automatic storage water heater shall be built for a minimum working pressure of one hundred fifty (150) pounds per square inch, whenever any of the three following limitations are exceeded:

(a) A heat input of 200,000 B.T.U. per hour;

(b) A water temperature of 200 degrees F.; and

(c) A nominal water containing capacity of 120 gallons.

300.5 Each hot water tank shall be stamped with the A.S.M.E. symbol to indicate that it is constructed in accordance with the Unfired Pressure Vessel Code of the American Society of Mechnical Engineers. It shall also be stamped with the name of the manufacturer, the maximum allowable working pressure, the year built, and the identifying number of the National Board of Boiler and Pressure Vessel Inspectors.

300.6 Applications for permits for hot water storage tanks as described in §300.4 shall be accompanied by the Manufacturers' Data Report which shall be signed by an inspector licensed to inspect boilers and pressure vessels by the National Board.

## 300 HOT WATER STORAGE TANKS AND WATER HEATERS (Continued)

300.7 Each hot water storage tank which is made of ferrous metal shall be lined in accordance with subsection §300.11. Tanks twenty-four inches (24") in diameter and larger shall have an eleven inch (11") by fifteen inch (15") manhole opening.

300.8 Gas-fired automatic storage water heaters shall bear a label indicating approval and listing by the American Gas Association.

300.9 Oil fired or electrically heated automatic storage water heaters shall bear the U.L. label to indicate listing by Underwriters Laboratories, Inc.

300.10 Each storage water heater shall bear the manufacturer's trade name, if any, the catalog number, the firing rate (input), the output in gallons per hour at one hundred degrees Farenheit (100° F.) rise in temperature, and the nominal capacity in gallons of the storage tank.

300.11 Any of the equipment specified in §§300.1 through 300.10 may be built of any alloy or non-ferrous metal that will resist corrosion. They may also be lined or clad with material that will not have a contaminating effect or will not affect the color, taste or other physical or chemical properties of the water contained therein. The material and method of application shall be submitted for approval.

300.12 Storage tanks shall be supported upon metal supports of pipe or structual steel resting upon the floor, or they may be hung from supports attached to structural steel or concrete beams, provided the beams have been determined to be of sufficient strength to support the additional weight; or they may be installed upon concrete saddles. Provision shall be made to take care of expansion.

300.13 Tanks shall not be supported by their piping system. Manhole openings shall be kept clear of all walls, pipes, or other obstructions.

300.14 Circulating pipes between heating elements and storage tanks shall be of non-ferrous metal. No valve shall be placed in any circulating line.

300.15 Each gas-fired water heater shall be provided with an approved draft diverter installed in accordance with the manufacturer's design, and shall be connected to an effective chimney shall be above the entrance of other vent connectors or breechings.

300.16 In commercial and industrial establishments when a connection to a chimney is impracticable, the installation of an automatic water heater may be approved by the Director if the following requirements are met:

(a) The maximum flow of gas shall be limited by fixed orifices to values in relation to the net cubical contents of the space in which the heater is located as specified in Table 3-1;

(b) In no case shall the maximum input rate exceed 10,000 B.T.U. per hour; and

(c) The heater shall otherwise conform to these regulations.

300.17 No water from a hot water supply boiler, automatic water heater coil or tank shall be used for building heating, except that water to be used for auxiliary space heating may be by-passed from any such boiler or heater, provided there is no actual withdrawal or possible leakage of water from the unit, and that all surfaces and connections in contact with the water are of copper or other approved corrosion resistant material.

300.18 A tank currently in use shall not be painted, lined or repaired on the inside with any material or in any manner that will affect either the color or taste of the water supply after the tank is put into service.

300.19 Any material intended for use as a lining or protective coating for the interior of tanks shall be submitted for approval and, if found acceptable, may then be used.

300.20 The water supply connections to and from the tank shall be disconnected or plugged while the tank is being cleaned, painted, lined or repaired, to prevent any foreign fluid or substance from entering the distributiuon piping. Adequate measures shall be taken for the protection of workmen in the tank.

300.21 Any repair by welding on a tank shall be done by a welder qualifed and licensed by the Department and the work shall be done under the supervision of a D.C. Boiler Inspector or an insurance company.

300.22 When any changes or additions are made to an existing hot water supply system or when a storage tank is replaced or moved, compliance with this title shall be required; Provided, that when there is no available opening in the top of an automatic storage water heater having a nominal water containing capacity of one hundred twenty (120) gallons or less, the valve shall be installed in the outlet header from the heater with only one fitting between the relief valve and the tank.

## 300 HOT WATER STORAGE TANKS AND WATER HEATERS (Continued)

300.23 No water heaters shall be installed in bathrooms, closets, or rooms used for sleeping purposes. Water heaters shall be accessible for cleaning and servicing.

## 301 HYDRO-PNEUMATIC TANKS

301.1 Each hydro-pneumatic tank shall be constructed for a minimum working pressure of one hundred fifty (150) pounds per square inch.

301.2 Each hydro-pneumatic tank shall be stamped with the following information:

(a) The A.S.M.E. symbol to indicate that it is constructed in accordance with the Unfired Pressure Vessel Code of the American Society of Mechanical Engineers;

(b) The name of the manufacturer;

(c) The maximum allowable working pressure;

(d) The year built; and

(e) The identifying number of the National Board of Boiler and Pressure Vessel Inspector.

301.3 Applications for permits shall be accompanied by the Manfacturers Data Report which shall be signed by an inspector licensed to inspect boilers and pressure vessels by the National Board.

301.4 Each hydro-pneumatic tank shall be provided with a gage-glass to show the level of the water in the upper section of the tank and a pressure gage. It shall also be provided with an eleven inch (11") manhole opening which shall be kept clear of all walls, pipes, or other obstructions.

301.5 Each hydro-pneumatic shall be equiped with a lever lifting safety valve bearing the A.S.M.E. symbol suitable for use with air, installed in a vertical position on the top of the tank and set to relieve at or below the maximum allowable working pressure of the tank. The valve shall be sealed to prevent tampering and there shall be no shut-off valve between the tank and the relief valve.

## 301 HYDRO-PNEUMATIC TANKS (Continued)

301.6 Each tank shall be provided with a pressure gage not less than four inches (4") in diameter connected directly to the tank by means of non-ferrous pipe. A cock with a tee handle shall be placed in the pipe near the gage. The gage shall be graduated to not less than one and one-half (1 1/2) times the maximum allowable working pressure of the tank.

301.7 Each hydro-pneumatic tank shall be piped to include a full-size, valved by-pass so that city water can be used in the building when the tank is not in service.

301.8 Each hydro-pneumatic tank shall be provided with a vacuum relieving device located on the top of the tank and a horizontal swing check valve in the water supply line from the pump to the tank, and in the District water supply by-pass line to the tank. A valved sludge drain pipe shall be installed at the bottom of the tank and shall discharge through an open connection into the drainage system of the building.

## §§302 - 304 RESERVED

## 305 RELIEF VALVES, GAGES, AND SAFETY CONTROLS

305.1 Each hot water storage tank and automatic water heater shall be equipped with safety controls, which shall prevent the temperature of the water in the tank from exceeding two hundred ten degrees Farenheit (210° F.) and the pressure from exceeding the maximum allowable working pressure for which the tank is built. Each such unit shall be equipped with the following:

(a) A pressure relief valve and a separate temperature relief valve of the spillage type;

(b) A combined temperature-pressure relief valve of the spillage type; or

(c) In the case of automatic water heaters manufactured as a unit, a thermostat and pressure relief valve.

305.2 Each pressure relief valve shall be of the lever lifting, spring-loaded type without disk on the pressure side of the valve. The valves shall be set to relieve at a pressure at or below the maximum allowable working pressure of the tank and shall be so arranged that they cannot be reset to relieve at a higher pressure than stamped thereon.

## 305 RELIEF VALVES, GAGES, AND SAFETY CONTROLS (Continued)

305.3 The valve or valves shall have sufficient capacity to prevent the pressure in the tank from rising more than ten percent (10%) above the maximum allowable working pressure. The rate capacity of the valve, or valves shall be equal to the maximum gross output of the heating unit installed. The gross output shall be determined from the data supplied on the manufacturer's name plate, catalog data, or from the fuel input.

305.4 Pressure relief valves shall bear the A.S.M.E. symbol to indicate that they comply with the requirements of the A.S.M.E. Low Pressure Heating Boiler Code in regard to construction, testing, and rating, and shall be plainly and permanently marked by the manufacturer in a way that the marking will be readable when the valve is installed and will not be obliterated in service.

305.5 The marking on pressure relief valves shall include the following information:

(a) The manufacturer's name;

(b) The type and catalog number;

(c) The pressure at which it is set to blow; and

(d) The capacity in pounds of steam or BTU per hour as certified by the National Board of Boiler and Pressure Vessel Inspectors.

305.6 No pressure relief valve shall be less than three-quarter inch (3/4") standard pipe size. Pressure relief valves used on non-A.S.M.E. approved, gas-fired equipment shall bear the A.G.A. symbol to indicate listing under the latest A.G.A. requirements and shall bear the A.S.M.E. symbol for equipment using other fuels.

305.7 Each pressure relief valve shall be installed in a vertical position directly on the top of the tank, or if there is no opening available, to a fitting in the hot water service line within two inches (2") from the tank.

305.8 Each pressure relief valve shall have a full size discharge pipe of non-ferrous metal, with an unthreaded open end, run to an approved plumbing fixture or if none is available to within six inches (6") of the floor. When the discharge pipe is over one inch (1") in diameter it shall be supported and braced to prevent any strain being placed on the valve.

305.9 If more than one valve is used, they may be connected to a manifold whose inlet pipe area shall be equal to the area of the inlet openings of all the valves. There shall be no restriction in size on either the inlet or discharge side of the valve or valves, and there shall be no shut-off valve or check valve between the relief valve and the tank.

305.10 Each temperature relief valve shall bear a label indicating approval and listing by A.G.A. and shall be submitted for approval to the Department.

305.11 Each temperature relief valve shall be of the automatic self-closing type with a test lever.

305.12 Each temperature relief valve shall be designed to open at two hundred degrees Farenheit (200° F.) or lower and be of sufficient capacity to limit the temperature to not over two hundred ten degrees Farenheit (210° F.).

305.13 It shall be non-adjustable and shall not be less than three-quarter inch (3/4") standard pipe size.

305.14 Each temperature relief valve shall bear a plate permanently attached, giving the following information:

(a) The name of the manufacturer;

(b) The model or type number of the valve;

(c) The temperature at which the valve will deliver its rated capacity; and

(d) The rated capacity in B.T.U.

305.15 Each temperature relief valve shall be installed in a vertical position on the top of the tank. Valves shall be screwed directly into the tank without interventing fittings unless the dip tube extension type is used, in which case he tube shall project into the tank. If a fitting is used, it shall be of non-ferrous material. Each valve shall have a full size discharge pipe with an unthreaded open end, run to within 6 inches of the floor or to a suitable fixture. There shall be no restrictions in size on either the inlet or discharge side of the valve, and there shall be no shut-off or check valve between the relief valve and the tank.

305.16 When a combination temperature-pressure relief valve is used, it shall conform with and be installed similarly to the requirements for pressure relief valves and for temperature relief valves. It shall bear both the A.S.M.E. symbol and required stamping in addition to the symbol of the A.G.A. for the temperature relief element.

305.17 Each aquastat used on an automatic gas water heater, unless provided as part of a complete A.G.A. approved unit, shall be listed by A.G.A. and shall operate to shut off the gas supply to limit the temperature of the heated water to not over two hundred ten degrees Farenheit (210° F.).

305.18 Hot water supply boilers, tankless heaters, electric heaters, immersion heating coils in boilers and any other type of heater shall be protected against excessive pressure, as provided herein.

305.19 Each hot water supply boiler and hot water storage tank shall be provided with a pressure gage connected directly to the boiler or tank by means of non-ferrous pipe. A cock with a tee handle shall be placed in the pipe near the gage. The gage shall have a dial not less than 4 inches in diameter and be so located that it can be easily read from the floor. It shall be graduated to not less then one and one-half (1 1/2) times the maximum allowable working pressure of the boiler or tank. Gages shall not be required for range boilers and domestic type water heaters.

305.20 Each hot water supply boiler, hot water storage tank, tankless heater, immersion type heater or any other type of heater shall be provided with a thermometer reading up to three hundred degrees Farenheit (300° F.), of a size and so located that it can be easily read from the floor. It shall be located in a well so that it will indicate the temperature of the water at or near the outlet and shall be accurate within two percent (2%). Thermometers shall not be required for range boilers or domestic type water heaters.

305.21 When hot water is used by the general public or by persons not in control of the heating equipment, an approved water mixing valve shall be installed to limit the temperature of the water at the fixture to not over one hundred forty degrees Farenheit (140° F.). A thermometer shall be installed on the discharge side of the mixing valve and be of a size and so located as to be easily read.

## 306 PENALTY

306.1 Any person who violates or fails to comply with any one or more of the provisions of the Boiler Inspection Act, approved June 25, 1936, or of this chapter, shall upon conviction thereof in the police court of the District of Columbia, on information filed by the Corporation Counsel or any of his or her assistants be subject to a fine of not to exceed $100 or to imprisonment for not more than 90 days, or both, for each and every violation thereof and each violation shall constitute a separate offense.

## TABLE 3-1

## MAXIMUM PERMISSIBLE FLOW FOR UNVENTED COMMERCIAL AND INDUSTRIAL WATER HEATERS
(see §300.16)

| Net Cubical Contents of Room or Space in Cubic Feet | Permissible Maximum Gas Flow in Cubic Feet per hour | |
|---|---|---|
| | *Column No. 1 | **Column No. 2 |
| 1000 to 1500 | 2 | 3 |
| 1500 to 2000 | 3 | 4 |
| 2000 to 2500 | 4 | 5 |
| 2500 to 3000 | 5 | 6 |
| 3000 to 3500 | 6 | 7 |
| 3500 to 4000 | 7 | 8 |
| Over 4000 | 8 | 8 |

*Column No. 1 applies to appliances when located in areas which do not have permanent openings to other areas.

**Column No. 2 applies to appliances when located in areas which have permanent openings of at least 15 sq. ft. leading to another area of equal or greater cubical content.